

## CLAIMS

What is claimed is:

1. An auto detection method for use by an answering device for matching a communication protocol of a calling device with one of a plurality of communication protocols being supported by said answering device, said auto detection method comprising the steps of:

receiving a predetermined amount of received data by said answering device from said calling device, wherein said data are indicative of said communication protocol of said calling device;

analyzing said received data to determine one of said plurality of communication protocols; and

transmitting a pre-determined data pattern by said answering device to said calling device during said steps of receiving and analyzing.

2. The auto detection method of claim 1, wherein said pre-determined data pattern is mark idle.

3. The auto detection method of claim 1, wherein said one of said plurality of communication protocols is V.110 protocol including a plurality of V.110 data rates, and said analyzing step determines one of said plurality of V.110 data rates.

4. The auto detection method of claim 3, wherein said analyzing step further determines a line speed by reading a byte of said received data.

5. The auto detection method of claim 1, wherein said analyzing step determines that said received data matches an ISDN protocol.

6. The auto detection method of claim 1, wherein said analyzing step determines that said received data matches a V.110 protocol at 8K data rate if eight 0x7F

bytes are found in said received data.

7. The auto detection method of claim 1, wherein said analyzing step determines that said received data matches a V.110 protocol at 16K data rate if four 0x3F bytes are found in said received data.

5 8. The auto detection method of claim 1, wherein said analyzing step determines that said received data matches a V.110 protocol at 32K data rate if two 0x0F bytes are found in said received data.

9. The auto detection method of claim 1, wherein said analyzing step determines that said received data is a V.110 protocol at 8K data rate if a plurality of first 10 bits from each of a plurality of octets of said received data match a predetermined pattern.

10. The auto detection method of claim 1, wherein said analyzing step determines that said received data is a V.110 protocol at 16K data rate if a plurality of first and second bits of each of a plurality of octets of said received data match a predetermined pattern.

15 11. The auto detection method of claim 1, wherein said analyzing step determines that said received data is a V.110 protocol at 32K data rate if a plurality of first, second, third and fourth bits of each of a plurality of octets of said received data match a predetermined pattern.

20 12. The auto detection method of claim 1 further comprising the step of configuring said answering device according to said one of said plurality of protocols determined in said analyzing step.

13. The auto detection method of claim 1 further comprising the steps of:  
running a timer for a pre-determined period during said steps of receiving, analyzing and transmitting; and

configuring said answering device to an analog mode upon expiration of said timer if said analyzing step does not match said received data with one of said plurality of communication protocols.

14. An auto detector for use by an answering device for matching a communication protocol of a calling device with one of a plurality of communication protocols being supported by said answering device, said auto detector comprising:

a receiver capable of receiving received data from said calling device;

a memory capable of buffering a predetermined amount of said received data, wherein said data are indicative of said communication protocol of said calling device;

a processor capable of analyzing said received data to match said received data with one of said plurality of communication protocols; and

a transmitter capable of transmitting a pre-determined data pattern by said answering device to said calling device while buffering and analyzing said received data.

15. The auto detector of claim 14, wherein said pre-determined data pattern is mark idle.

16. The auto detector of claim 14, wherein said one of said plurality of communication protocols is V.110 protocol including a plurality of V.110 data rates, and said processor determines one of said plurality of V.110 data rates.

17. The auto detector of claim 16, wherein said processor further determines a line speed by reading a byte of said received data.

18. The auto detector of claim 14, wherein said processor determines that said received data matches an ISDN protocol.

19. The auto detector of claim 14, wherein said processor determines that said received data matches a V.110 protocol at 8K data rate if eight 0x7F bytes are found in

said received data.

20. The auto detector of claim 14, wherein said processor determines that said received data matches a V.110 protocol at 16K data rate if four 0x3F bytes are found in said received data.

5 21. The auto detector of claim 14, wherein said processor determines that said received data matches a V.110 protocol at 32K data rate if two 0x0F bytes are found in said received data.

10 22. The auto detector of claim 14, wherein said processor determines that said received data is a V.110 protocol at 8K data rate if a plurality of first bits from each of a plurality of octets of said received data match a predetermined pattern.

23. The auto detector of claim 14, wherein said processor determines that said received data is a V.110 protocol at 16K data rate if a plurality of first and second bits of each of a plurality of octets of said received data match a predetermined pattern.

15 24. The auto detector of claim 14, wherein said processor determines that said received data is a V.110 protocol at 32K data rate if a plurality of first, second, third and fourth bits of each of a plurality of octets of said received data match a predetermined pattern.

25. The auto detector of claim 14, wherein said processor further configures said answering device according to said one of said plurality of protocols.

20 26. The auto detector of claim 14, wherein said runs a timer for a predetermined period and configures said answering device to an analog mode upon expiration of said timer if said processor does not match said received data with one of said plurality of communication protocols.

27. An auto detection method for use by an answering device for matching a

communication protocol of a calling device with one of a plurality of communication protocols being supported by said answering device, said auto detection method comprising the steps of:

buffering a predetermined amount of received data by said answering device from said calling device, wherein said data are indicative of said communication protocol of said calling device; and

analyzing said received data to match said received data with one of said plurality of communication protocols, including a V.110 protocol, an ISDN protocol and a PIAFS protocol.

28. The auto detection method of claim 27 further comprising the step of transmitting a pre-determined data pattern by said answering device to said calling device during said steps of buffering and analyzing.

29. The auto detection method of claim 28, wherein said pre-determined data pattern is mark idle.

30. The auto detection method of claim 21, wherein said V.110 protocol includes 8K, 16K, 32K and 64K data rates.

31. An auto detection method for use by an answering device for matching a communication protocol of a calling device with a V.110 communication protocol being supported by said answering device, said V.110 communication protocol having an 8K data rate, said auto detection method comprising the steps of:

buffering a predetermined amount of received data by said answering device from said calling device, wherein said data are indicative of said communication protocol of said calling device;

extracting a plurality of first-bit positions from each of a plurality of octets of said

received data to generate a first bit pattern;

masking one or more bits of said first bit pattern to generate a second bit pattern;

and

comparing said second bit pattern with a predetermined test pattern to determine

5 said 8K data rate.

32. The auto detection method of claim 31, wherein said V.110 communication protocol has a 16K data rate, said auto detection method further comprising the steps of:

10 extracting a plurality of first-bit and second-bit positions from each of a plurality of octets of said received data to generate a third bit pattern;

masking one or more bits of said third bit pattern to generate a fourth bit pattern;  
and

comparing said fourth bit pattern with said predetermined test pattern to determine said 16K data rate.

15 33. The auto detection method of claim 31, wherein said V.110 communication protocol has a 32K data rate, said auto detection method further comprising the steps of:

extracting a plurality of first-bit, second-bit, third-bit and fourth-bit positions from each of a plurality of octets of said received data to generate a third bit pattern;

20 masking one or more bits of said third bit pattern to generate a fourth bit pattern;  
and

comparing said fourth bit pattern with said predetermined test pattern to determine said 32K data rate.

34. The auto detection method of claim 33, wherein said answering device

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